PORT-A-COOL®

Series 2000

OWNERS MANUAL
for Hazardous Location Units

U.S. Patent 6,223,548

U.S. Patent D 362,905

U.S. Patent 6,502,414

FOR ELECTRIC MODELS
PAC2K36EP
PAC2K48EP

port•a•cool® portable evaporative cooling units

KÜÜL® PADS

MANUFACTURED BY PORT-A-COOL, LLC

PORT-A-COOL®

Evaporative Cooling Units

OWNERS MANUAL

FOR
HAZARDOUS LOCATION MODELS

PAC2K36EP AND PAC2K48EP
(BUILT TO: CLASS I, GROUP C & D)

I. INTRODUCTION

The PORT-A-COOL® unit is a fully self-contained, portable, high efficiency evaporative cooler that is proudly made in America at our factory located in Center, Texas.

A. What is Evaporative Cooling?

When trying to understand evaporative cooling, it may be best to think of air as being like a sponge, in that regard, air has an ability to absorb moisture that it comes in contact with. The amount of moisture that the air will absorb depends on the state of the air, or specifically, how much moisture the air already contains and the temperature of the air. If the air is warm and contains only a small amount of moisture, it will more readily absorb moisture. As air cools, its volume decreases, and with it, its ability to absorb moisture decreases.

The term "relative humidity" describes the quantity of water in the air in relation to its total capacity. Any volume of air at any given temperature has an ability to hold a certain quantity of moisture. If the air contains 20% of its total capacity to hold moisture, the relative humidity is said to be 20%. Whereas, a humidity of 100% indicates that the air at this temperature and pressure is holding all the moisture it can. If the air has less that 100% relative humidity when entering the PORT-A-COOL® unit, then it has the ability to hold more moisture, and will thus evaporate more water and cool more effectively.

When describing the amount of moisture in the air, the term relative humidity is used because the absorption capacity of air changes relative to air temperature. The warmer the air, the more absorbant it becomes, and can consequently hold more water. That is to say that air that has a 100% relative humidity can hold no more water vapor. However, if the air is heated, it expands, and as a result the relative humidity decreases even though the total amount of water vapor in the air has not changed. As a result, we must describe the level of humidity relative to its maximum capacity. Is it a 50˚F sponge or an 80˚F sponge? An 80˚F sponge will hold more water at 50% humidity than a 50˚F sponge.

How is cooling produced? In order to evaporate water, heat (energy) is required. In fact, the evaporation of one gallon of water requires almost 8,700 BTU's. Where does this heat come from? The heat comes from whatever the water is in contact with as it evaporates. This could be a hot sidewalk, your body, a tree, or from the air itself. As the heat is removed from an object, the temperature of that object is decreased. In the case of the PORT-A-COOL® unit, heat is removed from the air, reducing the temperature of the air.

It is important to realize that the temperature of the water does not have a great effect upon the cooling produced by the evaporation. If you were to place a gallon of 50˚F water on a warm sidewalk, it would consume 9,000 BTU's during its evaporation, thus making the sidewalk 9,000 BTU's cooler. A gallon of 90˚F water would produce 8,700 BTU's of cooling, only a 3 percent difference in the total result. This translates into a difference of less than 1˚ F in the performance of a PORT-A-COOL® unit.

The following table demonstrates the BTU's removed from the air based on a given amount of water evaporated in an hour by the **PORT-A-COOL®** unit.

U. S. Gallons / Hour	Total BTU's Removed
10 (37.8 liters or 8.3 Imperial Gallons)	87,000
12 (45.4 liters or 10.0 Imperial Gallons)	104,400
14 (53.0 liters or 11.7 Imperial Gallons)	121,800

For actual temperature drops refer to Appendix A.

In simple terms, evaporative cooling is nature's way of cooling. The **PORT-A-COOL®** unit utilizes the same phenomenon, but in an extremely efficient manner.

B. Humidity and Evaporative Cooling.

A given volume of air at a certain temperature and pressure has the ability to absorb and hold a certain amount of water vapor. If that volume of air contains 50% of the amount of moisture that it is capable of holding, it said to be at 50% relative humidity. The higher the temperature of the air, the higher the amount of moisture it is capable of holding. Any change in the temperature without a corresponding change in the pressure results in an increase or decrease in the amount of water vapor the air can hold.

If the temperature increases without an increase in the pressure, the result is a decrease in the relative humidity, and thus an increase in its ability to hold moisture. That is to say that in the morning the humidity may be high, but as the day passes and the temperature increases the relative humidity will naturally decrease.

The extent to which relative humidity decreases through the day can be affected by local weather systems and proximity to large bodies of water. If an increase in temperature accompanied by a weather system containing moisture moves in, then the drop in humidity will not be as great. Nevertheless, the fact remains that relative humidity does drop as air temperature increases. In fact, for every 20˚F rise in temperature, the moisture-holding ability of air doubles. For instance, if the temperature of the air was 70˚F and the relative humidity was 100% at 5 a.m., and the temperature increased to 90˚F at noon, the moisture holding ability of the air would double.

As a result, the air would now be holding only half of the moisture it is capable of holding, and the relative humidity of the air would drop to 50%.

The hotter the day, the drier the air becomes, and the more cooling that can take place through the evaporation of water. This means that when the day gets hot enough to require cooling, the relative humidity will be much lower than in the morning and will allow an evaporative cooling device to work more effectively.

Since any evaporative cooling device must evaporate water to achieve cooling, more water vapor is put into the air. As the ambient relative humidity increases, it becomes more difficult to put moisture into the air. The efficiency of any evaporative cooling device is directly related to its ability to evaporate water (cooling the air) at a given relative humidity. A unit with low efficiency will cool only at low relative humidity levels, while a unit with high efficiency can achieve effective cooling at much higher humidity levels.

C. Evaporative Cooling and the PORT-A-COOL® unit.

The **PORT-A-COOL®** unit is the state-of-the-art, high efficiency, portable evaporative cooling system that utilizes high efficiency **KÜÜL®** brand, rigid cooling media, manufactured with the patent pending ***"thru-cure"*** ™ process.The **PORT-A-COOL®** unit's unique patented housing enclosure, along with the **KÜÜL®** brand high efficiency cooling media, allows the unit to cool effectively in very high relative humidity conditions. Conditions that other portable evaporative cooling devices, such as the old style "swamp coolers", cannot approach.

The public has an initial tendency to equate the **PORT-A-COOL®** unit with the "swamp cooler," types of evaporative coolers and, in reality, the only thing that they have in common is that they are both evaporative coolers, much as the 1973 model automobile and 2001 model automobile are both cars. The key to efficient evaporative cooling is using a specially designed, high efficiency, rigid cooling media contained in a properly designed housing to insure effective directing of the air over the water saturated media at the proper velocity. The **PORT-A-COOL®** unit has incorporated all of these features and more.

As explained in PART B of this section, the effectiveness of the **PORT-A-COOL®** unit is best appreciated when it is above 85˚F and below 75% relative humidity. By the time the outside temperature reaches 85˚F, the humidity is almost always below 75%. Generally, as one goes up, the other goes down.

For actual temperature drops refer to the charts of Appendix A.

I. SETUP

A. Unpacking the PORT-A-COOL@ unit.

The PORT A-COOL HAZARDOUS LOCATION MODELS (PAC2K36EP and PAC2K48EP) are shipped strapped to a plastic pallet with a large cover box strapped over the **PORT-A-COOL® unit**. It is a simple matter to cut the strap and remove the box by lifting it over the **PORT-A-COOL® unit**. This will expose the plastic dust cover. Remove the dust cover. At this time two (2) people can remove the **PORT-A-COOL® unit** from the pallet. Due to the additional weight of the unit caution should be taken in removing the unit.

B. Removing the cooling media. (Disconnect Power)

Caution- Disconnect power before performing this operation!!

The **PORT-A-COOL® unit** should now be exposed to allow removal of the cooling media (pads). The front flap must be removed to allow access to the cooling pads. Start with the center pad, which should be tilted out from the top and lifted out of the drain trough. The two pads to either side of the center pad may then be removed in the same manner. Should you desire to remove the two outside pads, they must first be pulled sideways toward the center of the **PORT-A-COOL® unit** until they clear the side retainer. They may then be removed as the other pads. Removal of the pads allows for inspection of the interior of the unit. Make sure all connections are tight and both motor and pump are secure.

D. Connecting the water and electricity.

Water Connection (PORT-A-COOL® unit must be upright and on a level surface.)

After the **PORT-A-COOL® unit** has been thoroughly tested at the factory, the special female/female adapter is connected to the brass bulkhead connector on the left side of the **PORT-A-COOL@ unit** (when looking at the fan side). Simply attach a standard garden hose to the brass female/female adapter.

Verify that the rubber hose washer is in place before attaching, and tighten the fitting to guarantee that a secure connection is made. Once the hose connection is made, water may be turned on to the **PORT-A-COOL® unit**. Water should now be entering through the float valve to fill the sump tank.

To verify that your connections are well made, manually lift the red float in the float valve until it seats against the top of the valve housing. The water flow should stop and the inlet connections may now be visually checked for leaks, paying particular attention to the hose connection to the float valve and the connections to the bulkhead fitting, these connection may loosen during shipment.

Water supply inlet pressure should be limited to 50 psi maximum.

The cooling pads may now be replaced by reversing the removal operation above in Section I. Paragraph B.

Electrical Connection

PORT-A-COOL® unit must be upright and sitting on caddy with cooling pads installed!

These models utilize a single power cord and control switches. The power cord on this unit is 50' of 14-gauge 3-wire grounded cord *with* out plug, so the unit can be wired to meet local code requirements. Check the chart below to determine what the electrical requirements for your specific model may be. The use of separate multiple outlet devices is not recommended.

When making electrical connections, insure that local and national codes are adhered to.

ELECTRICAL REQUIREMENTS

PORT-A-COOL® MODEL	VOLTS +- 10	FREQUENCY	MAX AMPS	MAX WATTS
PAC2K36EP	115	60	13.6	1200
PAC2K48EP	115	60	18.1	1750

II. OPERATING PROCEDURES

A. Placement of the PORT-A-COOL@ unit.

PORT-A-COOL@ units should be used in well-ventilated areas only.

There are three primary considerations when deciding where to place the **PORT-A-COOL® unit**.

1) Fresh Air Supply -The rear of the **unit** (**pad area)** must be placed so to insure that a smooth, uninterrupted supply of fresh air is available.

2) Air Pattern -The cool air discharged from the **PORT-A-COOL® unit** should have a clear area to circulate in, as free of obstruction as possible.

3) Ventilation (Exhaust) -There should be a defined place in which the air from the **PORT-A-COOL® unit** can be exhausted from the area being cooled. This is to prevent the **unit** from recirculating air that has already been through the cooling process.

A primary consideration when actually deciding where to place **PORT-A-COOL® unit** is the direction of the air flow. The PORT-A-COOL@ unit creates a fan-shaped air pattern that disburses the air over a large area. This pattern may be disturbed or broken up by obstacles such as shelves, work benches, etc. It is important to insure that a clean, unbroken path for the air from the **PORT-A-COOL® unit** is provided to the maximum extent possible.

It may be desirable to raise the **PORT-A-COOL® unit** above any low obstructions in order to increase the overall coverage. When raising the height of the **PORT-A-COOL® unit**, insure that the platform constructed for holding the **PORT-A-COOL® unit** is stable, well constructed, and will not allow the **PORT-A-COOL® unit** to tip over. The **PORT-A-COOL® unit** MUST be level on its base. When supporting with a platform, allow for the full weight of a functioning **PORT-A-COOL® unit** by including the weight of the water both in the sump tank and the added weight of the water-saturated cooling pads. The total weight could be in excess of 500 lbs. (227 kg.).

When the **PORT-A-COOL® unit** is placed near a wall or other obstruction, it is recommended that a distance of at least 3 feet from the wall or obstruction to the face of the cooling pads is maintained. This allows the unrestricted flow of Warm air to the back of the **PORT-A-COOL® unit**. When using multiple **PORT-A-COOL® unit** in close proximity, be sure to aim the **PORT-A-COOL® unit** so that the air flows compliment each other and not oppose. Opposition will negate the air flow and allow an area of dead air to accumulate between two or more **PORT-A-COOL® units**.

B. Filling with water.

Referring to Section I, Part D, which details how to connect the water supply line, it is now a matter of turning on your supply valve and allowing the **PORT-A-COOL® unit** sump tank to fill with water. Once the sump tank is full, the float valve will shut off the supply flow. (50 PSI maximum inlet pressure.)

C. Starting the pump and adjusting the water flow.

CAUTION -DO NOT RUN PUMP WHEN SUMP IS DRY.

Once the sump tank is full, the pump may be turned on by moving the pump switch to the 'ON' position. After the pump is turned on, the blue pump prime valve (located above & to the left of the spray bar adjustment) **should be opened for 3 seconds and then closed**. This will prime the internal brass pump.

CAUTION - DO NOT LEAVE PRIME VALVE ON OR THE UNIT MAY FLOOD!

When initially turning on the pump, the level in the sump will drop suddenly and restart the flow of supply water. This is a normal condition as the cooling pads require a large amount of water for proper wetting.

When the **PORT-A-COOL® unit** is new, the new pads will require an initial 'breaking-in' period. This period is required to start the pads absorbing the water into the paper. It may take up to a week before maximum efficiency is reached.

It is important to insure that the spray bar is properly adjusted when first starting the water flow in the **PORT-A-COOL® unit**. Adjusting the flow of water from the spray bar is accomplished by using the **SPRAY BAR ADJUSTMENT VALVE** on the side of the unit.

D. Starting the fan. (Cooling pads must be installed and caster brakes must be engaged.)

Starting the fan is as simple as turning the fan switch to the **'ON'** position.

Adjust the water flow over the cooling pads where the pads appear to have a few dry streaks in them.

When turning the fan off at the end of the day or week, the pump should be turned off about 15 minutes before the fan to allow the cooling pads to dry. This will enhance the life of the pads.

Ill. MAINTENANCE & STORAGE

Very little maintenance is actually required on the **PORT-A-COOL® unit**. The primary topic which accounts *for* most of the maintenance on the **PORT-A-COOL® unit** is cleanliness. Keeping the **PORT-A-COOL® unit** clean will do more than any other single item to keep your new **PORT-A-COOL® unit** in peak operating condition. The rugged, corrosion-resistant construction of the **PORT-A-COOL® unit** and industrial grade components make for the low maintenance characteristics of the **PORT-A-COOL® unit**.

A. Daily Maintenance

Daily maintenance is really more an operational consideration than actual maintenance. On a daily basis, the pump should be turned off approximately l5 minutes before the fan is turned off. This will allow the cooling pads to dry out and help extend their life, helping to control the growth of algae, mildew, mold, bacteria and other odor-causing elements.

B. Weekly Maintenance

At the end of the week or at a scheduled time, the unit should be shut down and the sump tank should be drained. This is accomplished by closing the Spray Bar Adjustment Valve and opening the Drain Valve. If it is desired, a hose may be attached to the Drain Valve to direct the drained water to a remote disposal area. Once the Drain Valve is open, starting the pump will drain the unit.

Once the sump is drained and the power disconnected, the pads may be removed to allow inspection of the sump tank. *Assuming* that the **PORT-A-COOL® unit** is in a dusty environment, dust will be collected in the sump tank. This dirt may be vacuumed out using a wet/dry shop vacuum and wiped clean with a cloth.

The inlet strainer should be removed, inspected and cleaned. It is located at the bottom end of the pump siphon hose assembly.

C. Storage

Storage of the **PORT-A-COOL® unit** is very simple.

1) Drain all water from the sump tank and clean as instructed above, ensuring that the pads and sump are completely dry.
2) Roll up the electrical power cord to insure that they will not be rolled over, tripped over or caught in equipment.
3) Cover the **PORT-A-COOL® unit** completely to prevent dust build-up and store in a dry area. This also helps prevent damage to the pads.

V. TROUBLESHOOTING / REPAIR

NOTICE: POWER CORD MAY BE REPLACED ONLY BY THE MANUFACTURER OR QUALIFIED AGENT!!

A. Troubleshooting

The most common problems encountered with a PORT-A-COOL® unit are operational problems. The PORT-A-COOL® unit consists of three systems. It is important to determine which system of the PORT-A-COOL® unit the problem is associated with. Certain problems may be associated with more than one system.

When determining which system that the problem is associated with you must first define the problem, i.e., the pump is not running. Although this might seem a bit over-simplified, several things may cause a particular problem. So while defining the problem, a careful check of all systems should be made to fully understand the extent of the problem.

If you have a complete understanding of all the systems of the PORT-A-COOL® unit and how they depend on each other, it becomes much simpler to define and solve any problems.

Although the PORT-A-COOL® unit is designed to be simple to maintain, it will be necessary to have some basic hand tools (screwdrivers, pliers, adjustable wrenches, etc.) as well a volt/ohm meter for troubleshooting the electrical system.

FAN SYSTEM

CAUTION

Please use caution when troubleshooting or repairing all electrical components. Be certain that all power is disconnected from the PORT-A-COOL® unit before the cooling pads are removed to gain access to the fan.

BELT DRIVE MODELS

PROBLEM	CHECK	SOLUTION
Fan motor won't run and makes no sound.	Power cord, switches, circuit creaker, etc.	Reconnect power, reset breaker.
Fan motor won't run and makes a humming sound.	Blade in contact with shroud	Check mounting bolts.
	Motor stalled (will not turn by hand)	Replace motor.
Breaker trips or fuse blows when fan is started.	Motor stall (as above). Other items on circuit.	Replace motor. Remove other items.
Motor overheating and shutting off and restarting several minutes later.	Inlet air obstructed or too close to wall.	Provide minimum 36 inch inlet clearance.
	Faulty motor.	Replace motor.
Fan motor won't run and switch makes soft clicking sound.	Switch making good contact.	Replace switch.
Fan motor won't run and has a burning smell and hums.	Start capacitor leaking from cover.	Replace capacitor.
	Motor stall (as above).	Replace motor.
Fan blade doesn't turn and unit makes squealing sound.	Fan Belt, loose or broken.	Tighten or replace fan belt.
	Fan pulley spinning on shaft.	Tighten pulley set screw.
Fan belts do not last very long.	Motor and fan pulleys misaligned	Realign motor and mount.
Fan will not reach speed but turns and makes humming sound.	Capacitor (where visible) and motor electrical connections.	Replace capacitor or motor.

WATER SYSTEM

The water system consists of three primary elements: 1) Water Delivery System, 2) Spray Bar Assembly; 3) Pump. Troubleshooting of this system is fairly simple.

The Water Delivery System consists of two assemblies: A) The Water Inlet assembly and B) The Plumbing assembly.

The Water Inlet assembly is made up of four components: 1) The water supply connection hose, 2) The bulkhead fitting, 3) The float valve connection hose and 4) The float valve.

The Plumbing assembly consists of three elements: 1) Riser (PVC components), 2) Drain Valve, 3) Spray Bar Adjustment Valve. The 16 inch model has no riser or valves.

The Spray Bar Assembly consists of two components: 1) Spray Bar, 2) 4 foot connection hose.

The pumps that actually move the water through the delivery system are discussed in the charts below. These charts indicate the major symptoms of problems that may be encountered with the Water System components.

WATER INLET SYSTEM

PROBLEM	CHECK	SOLUTION
Floor at side of **PORT-A-COOL®** unit is wet.	Water inlet hose is loose at supply hose or inlet hose is loose at bulkhead fitting	Tighten connections and/or replace hose washers.
PORT-A-COOL® unit overflows from sump tank or is spitting water through fan.	Float valve hose is loose at bulkhead fitting or at float valve.	Tighten connections and /or replace hose washers.
	Water pressure is too high to allow float valve to shutoff. (50 psi max.)	Reduce water pressure by checking in-line reducer.
	Float valve is not seating properly.	Check for particles in valve. Replace float valve.

PLUMBING ASSEMBLY

PROBLEM	CHECK	SOLUTION
Water spitting from the from the unit.	Cracked riser assembly. Spray Bar Adjustment valve.	Replace riser assembly.
Water leaking from Drain Valve.	Washer worn.	Replace washer.
	Stem worn.	Replace Drain Valve.
Water leaking from Spray Bar Valve.	Washer worn.	Replace washer.
	Stem worn.	Replace Spray Bar Valve.

SPRAY BAR ASSEMBLY (ALL MODELS)

PROBLEM	CHECK	SOLUTION
Too many dry streaks in the pads. by foreign material.	Holes in spray bar blocked Clean individual holes.	Remove and clean spray bar.
Water spitting from the unit.	Hose connection loose.	Tighten hose.
		Replace hose and washer.
		Reseat spray bar end caps

BRONZE PUMP (PAC2K36EP and PAC2K48EP Only)

PROBLEM	CHECK	SOLUTION
Pump motor will not run when switch is turned on.	Power cord, switches, circuit breaker, etc.	Reconnect power, reset breaker.
Pump motor hums when switch is turned on, but does not pump water.	Object jammed into impeller blade.	Remove object. Prime pump.
	Air Locked. Pump/Motor locked.	Replace pump/motor.
Pump makes loud noise while running	Pump bearings.	Replace pump.
	Object in impeller housing.	Clear object.
Breaker trips or fuse blows when switch is turned on.	Pump motor locked.	Replace pump/motor.
Pump will not run and power is available and pump is functional	Switch making closure contact.	Replace switch.
Pump motor running but pump is not turning.	Set screws on coupling.	Tighten set-screw / Replace coupling.

B. Repair Procedures

Only qualified and trained distributors or factory personnel should perform repairs!!

VI. REPLACEMENT PARTS

A. Returned Merchandise Authorization (RMA) Procedures

All Port-A-Cool® units, parts, or materials being returned to Port-A-Cool, LLC for warranty replacement or repair require an RMA (Return Merchandise Authorization) number.

There are two methods for replacing waranty parts:

1. The distributor can purchase the part with an RMA number and will only be charged for the cost of the part, not for the shipping. When the defective part is returned, the distributor's account will be credited for the cost of the part.
2. The customer / distributor can call Tech Support to get an RMA number to send the defective part back to Port-A-Cool, LLC. Once the part is received by Port-A-Cool, LLC, a replacement part will be sent at no charge.

Information needed to get an RMA number:

1. The UNIT serial number.
2. The UNIT model number (ex. PAC2K363S)
3. The part number or description of the part to be replaced.

Only major component parts need an RMA number, i.e. fans, motors, pumps, and some plumbing parts. For replacement of small parts, the serial and model numbers are still required, but the parts do not need ot be returned to Port-A-Cool, LLC.

For warranty replacement parts call PORT-A-COOL® Technical Support at 1-888-266-5243.
FAX: 936-598-1431 or support@port-a-cool.com.

Shipping Address
Port-A-Cool, LLC
721 FM 2468
Center, Texas 75935

Mailing Address:
Port-A-Cool, LLC
P.O. Box 2167
Center, Texas 75935

B. Port-A-Cool® Unit Limited Warranty

For one year from date of installation, Port-A-Cool, LLC, warrants any original component part or parts of the Port-A-Cool® evaporative unit found, upon examination by factory authorized personnel, to be defective in material or workmanship. All transportation charges on parts submitted for replacement or repair under this warranty must be borne by the purchaser. If said equipment develops such defects within this period, it will be repaired or replaced at our option. For breach of any implied or written warranty on this product, Port-A-Cool, LLC, shall not be liable for any incidental or consequential damages. This warranty is declared void if the equipment if found to have been misused, abused or tampered with by unauthorized personnel.

Due to warranty limits placed on our products by the original manufacturers, our warranty is limited on manufactured units and their original component parts as well as replacement parts to a total of one (1) year after the date of installation.

Port-A-Cool®

TEMPERATURE OUTPUT CHARACTERISTICS
10% TO 25% RELATIVE HUMIDITY

10% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
32.2	90	65	46.8	6.1	43
35.0	95	65	46.8	8.9	48
37.8	100	66	47.5	11.1	52
40.6	105	67	48.2	13.9	57
43.3	110	68	49.0	16.1	61
46.1	115	67	48.2	19.4	67

15% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
32.2	90	55	39.6	10.0	50
35.0	95	56	40.3	12.8	55
37.8	100	57	41.0	15.0	59
40.6	105	57	41.0	17.8	64
43.3	110	58	41.8	20.0	68
46.1	115	59	42.5	22.8	73

20% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
32.2	90	47	33.8	13.3	56
35.0	95	47	33.8	16.1	61
37.8	100	48	34.6	18.3	65
40.6	105	49	35.3	21.1	70
43.3	110	49	35.3	23.9	75
46.1	115	51	36.7	25.6	78

25% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
32.2	90	41	29.5	15.6	60
35.0	95	43	31.0	17.8	64
37.8	100	44	31.7	20.0	68
40.6	105	44	31.7	22.8	73
43.3	110	44	31.7	25.6	78
46.1	115	45	32.4	28.3	83

WET BULB TEMPERATURE	Wet Bulb Temperature @ Current Humidity Level
DRY BULB TEMPERATURE	Current Ambient Air Temperature
TEMPERATURE DIFFERENCE	Dry Bulb Temp Minus Wet Bulb Temp
TEMPERATURE DROP	Temperature Difference Multiplied by 72%
OUTPUT TEMPERATURE	Dry Bulb Temperature Minus Temperature Drop

Port-A-Cool®

TEMPERATURE OUTPUT CHARACTERISTICS
30% TO 45% RELATIVE HUMIDITY

30% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
26.7	80	34	24.5	13.3	56
29.4	85	35	25.2	15.6	60
32.2	90	35	25.2	18.3	65
35.0	95	36	25.9	20.6	69
37.8	100	37	26.6	22.8	73
40.6	105	38	27.4	25.6	78

35% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
23.9	75	30	21.6	11.7	53
26.7	80	31	22.3	14.4	58
29.4	85	30	21.6	17.2	63
32.2	90	32	23.0	19.4	67
35.0	95	32	23.0	22.2	72
37.8	100	33	23.8	24.4	76

40% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
29.4	85	27	19.4	18.9	66
32.2	90	28	20.2	21.1	70
35.0	95	29	20.9	23.3	74
37.8	100	27	19.4	27.2	81
40.6	105	29	20.9	28.9	84
43.3	110	28	20.2	32.2	90

45% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
29.4	85	24	17.3	20.0	68
32.2	90	25	18.0	22.2	72
35.0	95	25	18.0	25.0	77
37.8	100	25	18.0	27.8	82
40.6	105	25	18.0	30.6	87
43.3	110	25	18.0	33.3	92

WET BULB TEMPERATURE	Wet Bulb Temperature @ Current Humidity Level
DRY BULB TEMPERATURE	Current Ambient Air Temperature
TEMPERATURE DIFFERENCE	Dry Bulb Temp Minus Wet Bulb Temp
TEMPERATURE DROP	Temperature Difference Multiplied by 72%
OUTPUT TEMPERATURE	Dry Bulb Temperature Minus Temperature Drop

Port-A-Cool®

TEMPERATURE OUTPUT CHARACTERISTICS
50% TO 65% RELATIVE HUMIDITY

50% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
23.9	75	22	15.8	15.0	59
26.7	80	20	14.4	18.9	66
29.4	85	22	15.8	20.6	69
32.2	90	21	15.1	23.9	75
35.0	95	22	15.8	26.1	79
37.8	100	22	15.8	28.9	84

55% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
23.9	75	17	12.2	17.2	63
26.7	80	19	13.7	18.9	66
29.4	85	18	13.0	22.2	72
32.2	90	19	13.7	24.4	76
35.0	95	19	13.7	27.2	81
37.8	100	19	13.7	30.0	86

60% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
23.9	75	15	10.8	17.8	64
26.7	80	15	10.8	20.6	69
29.4	85	15	10.8	23.3	74
32.2	90	15	10.8	26.1	79
35.0	95	17	12.2	28.3	83
37.8	100	16	11.5	31.1	88

65% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
23.9	75	13	9.4	18.9	66
26.7	80	13	9.4	21.7	71
29.4	85	13	9.4	24.4	76
32.2	90	13	9.4	27.2	81
35.0	95	14	10.1	29.4	85
37.8	100	13	9.4	32.8	91

WET BULB TEMPERATURE	Wet Bulb Temperature @ Current Humidity Level
DRY BULB TEMPERATURE	Current Ambient Air Temperature
TEMPERATURE DIFFERENCE	Dry Bulb Temp Minus Wet Bulb Temp
TEMPERATURE DROP	Temperature Difference Multiplied by 72%
OUTPUT TEMPERATURE	Dry Bulb Temperature Minus Temperature Drop

Port-A-Cool®

TEMPERATURE OUTPUT CHARACTERISTICS
70% TO 75% RELATIVE HUMIDITY

70% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
21.1	70	10	7.2	17.2	63
23.9	75	10	7.2	20.0	68
26.7	80	11	7.9	22.2	72
29.4	85	11	7.9	25.0	77
32.2	90	12	8.6	27.2	81
35.0	95	12	8.6	30.0	86

75% RH

DRY BULB		TEMP. °F		OUTPUT TEMP.	
Temp. °C	Temp. °F	Difference	Drop	°C	°F
18.3	65	8	5.8	15.0	59
21.1	70	8	5.8	17.8	64
23.9	75	9	6.5	20.6	69
26.7	80	9	6.5	23.3	74
29.4	85	9	6.5	26.1	79
32.2	90	9	6.5	28.9	84

WET BULB TEMPERATURE	Wet Bulb Temperature @ Current Humidity Level
DRY BULB TEMPERATURE	Current Ambient Air Temperature
TEMPERATURE DIFFERENCE	Dry Bulb Temp Minus Wet Bulb Temp
TEMPERATURE DROP	Temperature Difference Multiplied by 72%
OUTPUT TEMPERATURE	Dry Bulb Temperature Minus Temperature Drop